

Title (en)  
IMPROVEMENTS RELATING TO HYDROPNEUMATIC SUSPENSION UNITS

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Application  
**EP 82300996 A 19820226**

Priority  
GB 8106272 A 19810227

Abstract (en)  
[origin: EP0059621A2] The present specification relates to a telescopic hydropneumatic suspension unit comprising a body member (10) connectible to one of the sprung or unsprung masses of a vehicle and provided with an internal hydraulic cylinder (12) wherein a piston (14) is reciprocable, a piston rod (16) connected to the piston (14) being connectible to the other of said masses. Flexible diaphragm means (36,38,D) co-operate with the body member (10) and said hydraulic cylinder (12) to define hydraulic chamber (40,44) respectively in communication with the hydraulic cylinder spaces (52,54) in front of and behind said piston (14), and a pneumatic chamber (42,46) contiguous with each hydraulic chamber (40,44). The end of the piston rod (16) within the hydraulic cylinder (12) is axially bored to act as a pump chamber (62) which engages over an axially apertured pump rod (64) which is axially secured within the cylinder (12), and which communicates with said hydraulic chambers (40,44) through suitably arranged pump inlet (&2) and delivery valves (68,70). Thus relative axial movement between the hydraulic piston rod (16) and the pump rod (64) is effective to transfer fluid from one hydraulic chamber (40,44) to another, with consequent effect upon the axial position of the hydraulic piston (14) in its cylinder (12). With known suspension units of this type accurate machining of virtually all of the respective pump parts, is required and certain complex components are used, the construction being therefore expensive to manufacture. The present invention seeks to overcome the above disadvantages by avoiding unnecessary and unnecessarily complex components and by eliminating close manufacturing tolerances in some major components. The present invention provides a fluid flow passage in the form of a groove (80) in the outer surface of the pump rod (64). The groove (80) communicates with the pump chamber (62) in the hydraulic piston rod (16) and co-operates at one end with a pump rod seal (76) carried by the hydraulic piston (14) or its piston rod (16), to permit fluid transfer to the pump chamber (62) from the high pressure end (52) of the hydraulic cylinder in front of the hydraulic piston (14) whenever said pump rod seal (76) is moved by the hydraulic piston (14) to a position wherein said end of groove (80) is opened to said high pressure end (52) of the hydraulic cylinder (12). Co-operation between the groove (80) and the pump rod seal (76) provides a very simple and reliable means of sensing or detecting the axial position of the piston (14) within cylinder (12) and of maintaining the piston (14) substantially in that position by balancing the rates of fluid flow to and from the high pressure end (52) of the cylinder (12).

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